

REMARKS/ARGUMENTS

Reconsideration and allowance of this application are respectfully requested. Currently, claims 9-10, 12-15, 17-29, 31-33 and 35-37 are pending in this application.

Rejections Under 35 U.S.C. §102 and §103:

Claims 9-10, 26, 28-30 and 33 were rejected under 35 U.S.C. §102(b) as allegedly being anticipated by Ambrosy (US 2002/0031306). Claims 9-10, 17-18 and 26-33 were rejected under 35 U.S.C. §102(b) as allegedly being anticipated by, or in the alternative, under 35 U.S.C. §103 (a) as allegedly being obvious over Gupta (U.S. '359). Applicant respectfully traverses these rejections.

Anticipation under Section 102 of the Patent Act requires that a prior art reference disclose every claim element of the claimed invention. See, e.g., *Orthokinetics, Inc. v. Safety Travel Chairs, Inc.*, 806 F.2d 1565, 1574 (Fed. Cir. 1986). In order to establish a *prima facie* case of obviousness, all of the claim limitations must be taught or suggested by the prior art. Neither Ambrosy nor Gupta teaches or suggests all of the claim limitations. For example, neither Ambrosy nor Gupta teaches or suggests “wherein said first optical component is flip chip mounted on the shared substrate...” and “the first component comprises a spacing layer which determines the distance from the bonding surface to the optical axis for the first component to achieve said optical coupling in use, said spacing layer comprising a glass material having both organic and inorganic components (emphasis added),” as required by independent claim 9 and its dependents. Similarly, neither Ambrosy nor Gupta teaches or suggests “wherein at least one of the

first and second optical components comprises a spacing layer, the spacing layer being of a glass material having both organic and inorganic components, between the optical confinement region and the shared substrate, said spacing layer being of a depth to provide said optical alignment,” as required by independent claim 28 and its dependents.

Glebov (U.S. Patent No. 6,922,508 – cited on Form-892 of the Office Action mailed January 31, 2006) discloses the use of a hybrid glass material. However, Glebov only discloses the use of the hybrid glass material as a possible cladding layer for a waveguide that is fabricated onto a substrate. Glebov fails to teach or suggest the use of a hybrid glass material in a flip chip mounted device at all, and certainly not as a spacing layer.

Section 23 (page 7) of the outstanding Office Action makes reference to two passages of Glebov: column 4, lines 20 and column 6, lines 15-20. The portion of Glebov including column 4, line 20 states the following:

“The silicon substrate is employed to exemplify the process. Therefore, the silicon substrate may be replaced by any other substrate, e.g., glass plate, printed circuit board, etc., which may be chosen according to the design requirements.”

This reference to col. 4, line 20 of Glebov is not understood by Applicant. Reference to a glass plate does not teach or suggest an organic/inorganic hybrid glass material.

Column 6, lines 15-20 of Glebov states the following:

“The waveguides or cores may be manufactured of any suitable material. For example, the waveguides may be formed using a highly transparent, highly heat-resistant polymer such as a fluorinated polyimide, or quartz or another glass or polymer material. The same

type of material may also be used for the cladding layers, or an organic and/or inorganic hybrid may be used."

This portion of Glebov makes reference to "an organic and/or inorganic hybrid", but only in the context of an alternative cladding layer for a waveguide. There is no discussion of its properties. There is only mention of the properties of the main materials that might be used.

The waveguides in Glebov are not flip chip mounted, but fabricated onto a substrate. However, the claims do not relate to the use of an organic-inorganic glass hybrid material in an optical assembly per se, as shown in Glebov, but only for the very particular use of such a material in adjusting distance in flip chip mounted devices in order to obtain alignment. For example, claim 1 explicitly requires "a spacing layer which determines the distance from the bonding surface to the optical axis for the first component to achieve said optical coupling in use, said spacing layer comprising a glass material having both organic and inorganic components." This potentially exploits the wide range of qualities of the materials in a particular manner. These qualities are discussed in some detail in the specification. (See, e.g., pages 17-18 of the specification). For example, page 17, lines 30-32 of the specification states "Hybrid glass materials are generally relatively stable and have mechanical properties which are more adjustable than either an organic material or an inorganic glass on its own." These qualities would be selected by one skilled in the relevant art to suit the purpose of any particular context. For example, a hybrid glass with a relatively low processing temperature would be used as a spacing layer for a device which cannot tolerate high processing temperatures. Other relevant qualities might be adhesion to a contact layer, stress modulus or stability.

A significant advantage discovered by Applicant is that when one can flip chip mount two or more components into accurate alignment on a substrate, without either of them having been fabricated in situ, one can source the components from anywhere. Also, as described in the specification, the use of a spacer layer means that even where the shared substrate is not planar, for example because it is provided with a recess for receiving a flip chip mounted component, fabrication of the substrate can have larger tolerances. Further, devices can be substituted without having to redesign the substrate to achieve optical alignment in the finished assembly.

Accordingly, Applicant respectfully requests that the above-noted rejections under 35 U.S.C. §102 and/or §103 be withdrawn.

Claim 12 was rejected under 35 U.S.C. §103 as allegedly being unpatentable over Ambrosy and Tada. Claims 13 and 38 were rejected under 35 U.S.C. §103 as allegedly being unpatentable over Ambrosy and Tada, and further in view of Glebov. Claims 14-15 were rejected under 35 U.S.C. §103 as allegedly being unpatentable over Ambrosy and further in view of Blauvelt. Claim 16 was rejected under 35 U.S.C. §103 as allegedly being unpatentable over Gupta and Glebov. Claims 19-22, 24 and 25 were rejected under 35 U.S.C. §103 as allegedly being unpatentable over Gupta and Glebov, and further in view of Nashimoto. Claim 23 was rejected under 35 U.S.C. §103 as allegedly being unpatentable over Gupta, Glebov, Nashimoto, and further in view of Kaneko. Claims 35-37 were rejected under 35 U.S.C. §103 as allegedly being unpatentable over Ambrosy, Tada, and further in view of Glebov. Each of these claims depends directly or indirectly from independent claim 9 or 28 and thus the comments made above with respect to Ambrosy and Gupta apply equally to these claims. Applicant submits that none of the

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cited second, third or fourth references (Tada, Glebov, Blauvelt, Kaneko and/or Nashimoto) resolve the above described deficiencies of Gupta or Ambrosy. For example, see the comments provided above with respect to Glebov.

Accordingly, Applicant respectfully requests that the various rejections under 35 U.S.C. §103 be withdrawn.

Conclusion:

Applicant believes that this entire application is in condition for allowance and respectfully requests a notice to this effect. If the Examiner has any questions or believes that an interview would further prosecution of this application, the Examiner is invited to telephone the undersigned.

Respectfully submitted,

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